CHAPTER V Geography and Economic Development

Mountains, Deserts, Steppes, and People

131 NOWHERE in the world is the influence of geography on people
•133 more dramatic than in Inner Asia. Sinkiang lies in the heart of a continent, as remote as possible from moisture-bearing winds from the oceans. On three sides it is enclosed by mighty mountain masses and on the eastern side by wide stretches of barren plateau. The snow-clad Tien Shan or Heavenly Mountains, rising to heights of 23,000 feet, extend across the province from west to east, dividing it into two unequal parts. The southern two thirds are the Tarim Basin, the land of oases and deserts. The northern third is Jungaria, traditionally the land of the nomads. The total area of the province is about 600,000 square miles, or twice the size of Texas.

133 The Tarim Basin is a desert which at its lowest point is actually
132 below sea level. Here men cannot live and farm by rainfall, which averages less than four inches a year. Water is the gift of the great mountains which fringe the desert on the north, west and south, rising in places to more than 20,000 feet. From the melting upland snows and glaciers, rivers cut their way down to the central oval desert. Where each river leaves the foothills, men dig canals to spread the water out in a fan, forming an oasis, so that the edge of the desert along the foot of the mountains is dotted by a series of oases. A trade road, looping around the desert, links the oases like beads on a string, forming a U with the open end toward the east.

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In Jungaria there is a little more rain, as much as ten inches a year in the more favored places, and here the desert is neither so vast nor so forbidding as in the Tarim Basin. There are fringes of grazing land on the slopes of the Altai in the north, the Tien Shan in the south, and other ranges in the west, but the herds must move frequently and the men who own them must move too, leading a nomadic life. Men learned to live in this land of poor rainfall only by learning how to master the animals which ate the grass which they themselves could not eat.

In addition to irrigated agriculture there is some dry farming in Jungaria, particularly in the river valleys along the Soviet frontier. Along this frontier, which rarely follows the watershed, three important rivers have their source in Sinkiang and their main course in Soviet territory. They are the Black Irtish, the only Sinkiang river whose waters reach the sea, and the Emil and the Ili, which are routes of communication between Soviet and Chinese territory.

The broad and fertile Ili Valley is enclosed between two arms of the Tien Shan which open toward the west into Soviet territory. It thus forms a distinct region which has closer geographic ties with Soviet territory than with Sinkiang itself. Its forests, mines, rich mountain pastures, and fertile arable lands offer the best prospects for economic development north of the Tarim Basin, but it has never enjoyed a sufficiently long period of peace and sound administration to permit exploitation of its resources. It has been fought over during the successive waves of migration and was largely depopulated in the eighteenth century. At present the valley supports an agricultural and nomadic population of less than half a million.

Both oasis agriculture and pastoral nomadism are such highly specialized ways of life that throughout the history of Inner Asia men never learned how to combine them. Cultivators and herdsmen fought each other, traded with each other, and sometimes ruled each other, but they never fused together in a new, mixed, and permanent society.

The totally new factor of machine-powered industrialism is

178 The totally new factor of
154 machine-powered industrialism is now beginning to penetrate the lives of both cultivators and [412] herdsmen. Industrially equipped engineering could lead water to fields which the oasis cultivator, working with his broad-bladed mattock, the traditional Inner Asian *ketman*, could never reach. Modern industry could process the wool and hides of the livestock breeder in ways which the nomadic society was never able to evolve. In addition, it could exploit mineral resources in ways which would make it possible to put together, out of the unjoined fragments which lie scattered through Sinkiang, a new, many-sided society of farming, livestock breeding, mining, industry, [382] technology, and levels of education previously out of reach. Of • [135] the primary industrial materials, Sinkiang has oil, coal, and probably iron in large but unknown quantities. It has water power. Of the scarcer industrial materials, it has copper. It also has gold.

177 The industrial civilization is approaching Sinkiang from two sides at once. From China, American planes sometimes fly in. A few American trucks and cars are already there. American bulldozers have pushed better roads nearer and nearer. One strategic road has already crossed a corner of the Tibetan plateau to the line of southern oases. American geologists have prospected the mineral resources. American arms equipped the Chinese forces which held the province in the last years of Kuomintang rule.

Soviet industrialization stands much closer to the frontiers of Sinkiang. It has already transformed the face of Soviet Inner Asia with mines, factories, new irrigation works, hydroelectric dams, and more facilities for advanced industrial training than there are in the whole of China. Soviet trade is essential to Sinkiang; and the only non-Chinese natives of Sinkiang who have had modern university training have received it in Soviet territory, not in China.

41 Today in Sinkiang, however, industry is still negligible, and the two principal types of economy are pastoral nomadism and oasis farming. Most of the oasis farming is in the Tarim Basin, where man brings water to the desert by irrigation. The homeland of nomadism is Jungaria, where man adapted himself to geography by abandoning agriculture and taking to the herding of animals.

There is also some voluntary development of agriculture by 241

nomads. There are Mongols in the Baitik Bogda who are both herders and cultivators.[3] Farming began among some of the Torgut Mongols along the Chingho, west of Manass, at the beginning of the present century.[4] In 1943, Kazakhs dug an irrigation canal from the bank of the Kunges, one of the main affluents of the Ili. Two kinds of change take place along the southern foot of the Tien Shan. Uighur owners of sheep in the oases send them up to the alpine meadows of the Kirghiz to pasture, and near Bai and Uch-Turfan Kirghiz, crowded out of these pastures, have taken to farming in the Taushkan and Kharabagh Valleys.[5]

Oasis Farming

There are two kinds of oases in Sinkiang: the oases of the south, which are sharply isolated from each other by desert stretches, and the oases of the north, which have fringes of land in which rainfall farming can be carried on, or still wider fringes of grazing land. The typical characteristics of oasis life are therefore much more sharply accentuated in the south. 133 ● 241

The first oasis makers were probably men who lived along the banks of the rivers in the desert, and in the marshes, where they caught fish, hunted, and gathered wild food crops. A "crop" of the Lopliks of the Lob Depression, the most primitive surviving community in the Tarim Basin, is the tender shoots of the marsh reeds. When irrigation began, it seems to have been practiced first on the lower courses of the rivers, where the soil was soft and the engineering problem required only the digging of simple ditches from the banks of the streams. In the course of time, as knowledge of engineering developed, the tendency was for the oasis to move upstream toward the boulder slope at the edge of the foothills, but not back into the gorges where the engineering problems were far too great. There were three reasons for the upstream shift: out on the plain, the slow speed of the water 241 312

[3] Douglas Carruthers, *Unknown Mongolia*, London, 1913, Vol. II, p. 462.
[4] Sung Po-lu, *History of Sinkiang*, 1913, chuan 2, p. 8 (in Chinese).
[5] R. C. F. Schomberg, "The Habitability of Chinese Turkestan," *The Geographical Journal*, Vol. LXXX No. 6, Dec. 1932, p. 510.

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241 312 silted up the canals; the flat level did not allow sufficient drainage from the fields, which gradually accumulated salts; the communities upstream had first access to the water. The drying up of Inner Asia has been blamed for the abandonment of ancient oases found out in the desert, but it is probable that the causes just described are more important than any change of climate in the last two thousand years.

312 Oasis engineering remains extremely simple. The basic pattern is a main canal from the river, branching into smaller canals, which branch in turn into the ditches which deliver water to the fields, all arranged so that water flows by gravity from level to level, without the pumping or bailing devices which are widely used in China and in Soviet Turkistan to lift water from lower to higher levels.[6]

[133] Of the rivers of Sinkiang, the most important for irrigation is the Yarkand Darya, known in its upper reaches as the Zaraf-shan.[7]

[6] Two kinds of weirs are used to divert water from the river into the takeoff canal. Field notes of an Academia Sinica expedition describe a solid weir which was examined at the point where the Aksu Darya forks into two streams, the Kone Darya or Old River and the Yangi Darya or New River. A fork of this kind is often formed when a river channel silts up and later a freshet of high water comes down the choked channel; the force of the water bursts out at one side of the old main channel, and a subsidiary stream is formed, flowing away from the main stream. Since the Old River irrigates the oases of Aksu and Avat, a solid weir was built to divert some of the water of the New River back into the Old River. Trunks of the *toghrak*, or wild desert poplar, were used as stakes. Between these, cribs were woven with smaller branches and twigs and filled with stones and rubble. A weir of this kind is of limited efficiency. When the river reaches flood level in July and August the weir is battered down, too much of the water of the Aksu Darya discharges into the New River, and the crops in the oases fed by the Old River are imperiled. Solid weirs are used on the larger streams. On smaller streams, where the irrigators hope to be able to control the flow of water, draw-weirs are made with openings or sluices. In some localities, such as Kargalik, instead of building permanent sluice gates or panels the sluices are closed temporarily with rubble.

[7] The Yarkand Darya has also repeatedly changed its course. Thus the brilliant Chinese scholar Hsu Sung described how two tributaries of the Yarkand Darya joined in the second decade of the nineteenth century to form the oasis of Merket, but Sir Aurel Stein's maps show that the present

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The Khotan Darya, the Konche Darya, and the Kaidu Gol provide enough water for the branching canals and settlements along their courses. The Aksu Darya, the Muzart, which flows to the Kucha oasis, and the Kizil Su or Red River flowing through the Kashgar oasis all fail to supply enough water for the oases on their lower courses.

In volume of discharge the rivers of the Tarim system are far behind the two great rivers of Soviet Inner Asia, the Syr Darya and the Amu Darya.[8] The total discharge of all streams in Sinkiang is about 3400 cubic meters per second, of which about 70 per cent is in the Tarim Basin. The total length of irrigation canals in Sinkiang was reported in 1943 to be 36,000 kilometers. The technique of utilization is defective in many ways. The lack of drainage to provide for washing out the salts deposited by irrigation has already been mentioned. There is a lack of storage lakes and reservoirs and even small-scale tanks, as a result of which it is estimated that from a third to a half of the potential supply runs to waste. A standard calculation, in irrigation engineering, is that a discharge of one cubic meter per second should irrigate over 6000 acres, whereas in Sinkiang the figure is estimated at 2530 acres.

A number of special practices in irrigation deserve description. Of these the most important is the *kariz* or underground irrigation channel, which is the characteristic feature of the Turfan oasis. A *kariz* is built by starting at ground level in the area which is to be irrigated and tunneling at a slight upward incline into the fan of detritus heaped up along the foothill range where it is hoped that water will be found. The tunneling is continued until the water table is reached. From the slope under which the tunnel runs, shafts are sunk down to the tunnel for ventilation. When the underground water is brought out to the open plain, it is carried farther by an ordinary canal. The length of a kariz

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junction is far downstream from Merket. It is this change of river channels that has probably caused the present severe shortage of water in Merket, the foremost cotton-growing oasis in Sinkiang.

[8] A. N. Kuropatkin, *Kashgaria*, Calcutta, 1882, p. 22.

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There is a controversy concerning the origin of the *kariz* which has a bearing on the ancient routes by which knowledge of various kinds was transmitted through Inner Asia into China and from China. Huntington asserted that the *kariz* was introduced into Sinkiang from Iran or Transcaspia, about 1780. Pelliot and Stein held almost the same view. On the other hand the eminent Chinese historian Wang Kuo-wei believes that it was first brought to Sinkiang from China after the opening up of the Western Regions in the Han Dynasty. These references do not exhaust the problem, for the *kariz* principle was used by the Greeks on Samos, and by the Etruscans in Italy in the sixth century B.C. In Central Arabia it is known as *saqi*, and in Morocco as *foggara*. Subterranean irrigation canals were also built by the Incas in Peru.

Springs and subterranean flows are supplementary sources of water in some oases. About 50 per cent of the water for irrigation in Komul comes from springs, as against 25 per cent each from *kariz* and rivers. In Kulja and several other large oases springs are used to irrigate rice fields, which require a very steady flow of water. In the miniature oasis of Kumish, south of Toksun, a spring with a discharge of only three cubic meters a day is the sole source of water for the irrigation of about eight acres of land. Closely related to springs are the streams which disappear in boulder fans and emerge again later in or beyond an oasis. The flow of such streams, which are called *sai*, is apt to be fluctuating; but except where they have been tapped by *kariz*, they are an important source of water which has not been fully utilized.

"Tanks" — as they are called in India — or small pits are used for the storage of drinking water in the towns of some oases, but not as reservoirs for irrigation water except in the dying oasis of Maralbashi. Most of the river water is taken off by oases lying upstream from Maralbashi, forcing the cultivators to store water when they can get it and keep it until they need to use it. Unfortunately the main reservoir has now silted up, so that unless a new one is dug the oasis will sooner or later have to be abandoned.

312 133 A unique irrigation device was introduced into the oasis of Komul by the Chinese administrator Chang Yao in the nineteenth century. Because of the exceptionally porous sandy soil in this oasis, he had water carried for miles across the desert in wooden troughs lined with felt. This device is too expensive for present costs.

Although agriculture in northern Sinkiang is also irrigated, cultivation is not so sharply isolated in oases as it is in the south. The main water supply for irrigation comes from the Ili, Manass, and Black Irtish rivers.

Of these the Ili is formed by the confluence of three rivers, the Kash, the Kunges, and the Tekes. The volume discharged by these three rivers at high water is 100 cubic meters per second for the Kash and Tekes and 30 cubic meters per second for the Kunges.

133 731 The Manass is a slow river, but when in flood it is troublesome. It cuts extra flood channels which discharge into marshes just below the Manass oasis, and consequently its terminal lake, Telli Nor, farther out in the plain, is steadily drying up.

The headwaters of the Irtish are in the Altai, where the snow level is much lower than in the Tien Shan. The spring flood therefore comes down six weeks earlier on the Irtish than it does on the Manass, which is beneficial for spring planting.

312 631 423 Wherever irrigation is practiced, water rights are even more fundamental than land ownership. In Sinkiang, there are two bodies of custom and practice with regard to water. One is associated with the *kariz*. The other prevails much more widely, has a complicated history, and a number of variants.

The rights, obligations, and customs associated with the simple practice of leading water in ditches from rivers undoubtedly go back to the ancient form of communal enterprise in which all the members of the community contributed their labor, and the water was shared out not to individuals with proprietary rights in particular fields, but to kinship groups cultivating fields to which they had a collective title.

In a community which is still lacking in large-scale private

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438 camel transport, the camels feeding on desert pasture as they go. Grain, cloth, and tobacco are the staples for sale from the oases to nomads. The return trade consists of sheep, goats, and cattle for slaughtering, cattle and horses as work animals, better quality horses for riding, and wool and hides as raw materials for artisan handicrafts.

One of the striking characteristics of the external trade of Sinkiang is that trade with China is essentially, in both its economic and its political aspects, trade with a foreign country. In spite of Chinese sovereignty, and the fact that Sinkiang has had a "standardized" provincial administration since 1884, the Chinese administrators of the Provincial Government have always had a strong tendency to make themselves into independent satraps. Under the Manchu Dynasty, Sinkiang drew an Imperial subsidy from Peking, and this political income was more important than the turnover of trade. Since 1911, under the Republic, the province has most of the time been "on its own," and its governors have manipulated all trade, including trade with China, neither for the purpose of building up the provincial economy nor in order to create an economic nexus between Sinkiang and the rest of China, but primarily to accumulate personal wealth in negotiable forms which could be deposited in safe haven somewhere outside of Chinese territory.

439 489 133 Geography also hampers trade between Sinkiang and the rest of China. The greatest expanses of desert in and adjacent to Sinkiang lie on the side toward China. The distance by camel caravan from Kuchengtze through Inner Mongolia to railhead in Suiyuan Province is at least 1200 miles. The distance is even greater by cart or caravan from Komul across the desert to the Kansu Corridor, then by cart through Kansu to railhead in Shensi Province; and cart transport is more expensive than camel transport. It is not surprising that, even in the early 1930's before the years of wartime disruption, only 12.5 per cent of Sinkiang's external trade was with China.

439 489 Historically, after the age of the Silk Routes and of medieval trade, tea became important in trade between China and Kashgar

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APPENDIX V Regions of Sinkiang

THE PHYSICAL framework of Sinkiang falls into six divisions. Taken from north to south, they have been described by Dr. S. Ting of the Academia Sinica as: 133

1. *The Northern Highlands,* forming the northern rim of Jungaria. Most of this region reaches an altitude of 5000 feet, with some peaks of 13,000 feet in the great Altai range which forms most of the frontier with the Mongolian People's Republic. There are two subregions, the Burgun plateau and, between it and the Altai, the sunken valley of the Black Irtish. The waters of the Irtish flow into the Ob, and all across Siberia to the Arctic Ocean. No other streams from Sinkiang reach the ocean; all die in inland deserts or salt lakes.

2. *The Jungarian Basin,* at an elevation of 600 to 1500 feet, comprises two subregions, the Manass Basin and the Chingho plain, both overlooked from the south by the snowy crests of the Tien Shan, which, however, are often invisible because of the dust haze over the lowlands. The Manass River slows abruptly as it comes out of the mountains, and feeds a wide area of swamps. In the Chingho plain three rivers, the Ching, Kur, and Borotala, converge to form Ebi Nor, a lake with no outlet at an elevation of 700 feet. Its ancient shorelines are 300 feet above the present surface, and in the plain around it there are both swamps and sand dunes.

3. *The Tien Shan range* forms a region in itself, occupying nearly a quarter of the area of Sinkiang. For several hundred miles its crests are crowned with snow. The highest peak

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133 is Khan Tengri, Lord of Heaven, with an altitude of over 23,000 feet. Below it is the greatest glacier, the Muzart, which is overlooked by magnificent cliffs of marble and porphyry. On the northern slopes of the main range there are deep evergreen forests and rich meadows, while the southern slopes are dry and unforested. Through gaps in the range run the main routes from Jungaria in the north to the Tarim Basin in the south. At the northwestern end of the range the Ili Valley, or Kulja plain, has an elevation of 2800 feet. With a rainfall of ten inches a year, this is the richest region in Sinkiang. Other subregions are the Turfan Depression which, under the shadow of peaks that range up to nearly 20,000 feet, drops to a depth of nearly 1000 feet below sea level; the Barkul Basin, and the Uch-Turfan Plain. The Bai Basin, though classed by some geographers with the Tarim Basin, is also assigned by Dr. Ting to the Tien Shan, because of its geological formation.

4. *The Tarim Basin* is a system of concentric zones. The rim of the basin is formed by the Tien Shan in the north, the Kunlun in the south, and the Pamirs and Alai in the west and northwest. At the foot of this rim there is a narrow belt of boulder fans enclosing the vast central desert of drifting sand dunes, the Taklamakan. The slope of the inner basin is from about 4000 feet in the west to about 2500 feet in the east. Into it flow the Khotan Darya, the Yarkand Darya, the Aksu Darya and the Konche Darya, which combine to form the Tarim River. Lesser streams like the Keriya and the Niya die in the desert before they reach the Tarim, while the Charchen reaches the Tarim only at its dying eastern end. The waters of the Tarim do not always reach their ancient terminal depression, the desert lake of Lob Nor, but end in vague reedy marshes. The oases of the Tarim Basin are formed on the rivers at the points where they leave the narrow, hard boulder fan to enter the wide desert.

5. *The Pei Shan Highlands* close off the eastern end of the Tarim Basin. The Pei Shan proper, or North Mountains, are a desert range forming the northern edge of the "Kansu Corridor" which reaches out from Northwest China to Sinkiang. The north-

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ern ranges of these mountains are called by the Mongols *Mechin Ola* or "Ape Mountains." Grouped with them, in Dr. Ting's classification, is the plateau called by the Chinese *Hsinghsinghsia* or "the Ravine of the Apes." In this whole region there are very ancient legends of "man apes" which capture human beings. Connected with these highlands are the Lob Plateau, known in Chinese as the White Dragon Heap, which rises east of the Lob Depression and marks the divide between the Tarim and the Sulu Rivers, and the Kuruk Tagh or Dry Mountains. The flat tops of all these heights mark the 5000 foot level of an ancient connected plateau. The Kuruk Tagh in particular are a very ancient formation of metamorphic rocks. Included under Dr. Ting's classification with the Pei Shan group instead of the Tien Shan formation is the subregion of the Kharashahr Basin, an intermontane trough enclosing the lake called Bagrach Kol at an altitude of 3300 feet, with desert to the east of it, sand dunes to the south, and swamps on its northern and western shores.

6. *The Kunlun Highlands* form the southern rampart of Sinkiang. Seen from the desert they form a mountain wall, but at their crest begins the northern plateau of Tibet, with heights of over 20,000 feet.

II

SINKIANG: THE LAND AND THE PEOPLE

131 161 Sinkiang or Chinese Turkestan is a spacious attractive land of about 550,000 square miles, approximately two and a half times the size of France. Yet the province is inhabited only by about four million persons, or an average of less than nine per square mile. By way of contrast Kiangsu Province, which contains Shanghai and other teeming port cities, is one-fourteenth the size of Sinkiang and yet, before the war, had a population density more than one hundred times as great!

131 By nature a distant and self-contained area, Sinkiang is enclosed on three sides by mountains and on one side by desert and barren terrain. On the west are the T'ien Shan (Heavenly Mountains), the Pamirs, and the Karakorum Mountains; to the south, the lofty K'unlun Mountains of Tibet; on the extreme north, the little visited Altai ranges; and on the east, the Gobi of Mongolia and the Tsaidam wastelands of Western Ch'inghai or Kokonor.

133 The interior of Sinkiang does have vast expanses of desert. But the T'ien Shan extend from west to east through the center of the province, the Manas and the Tarim River systems moisten immense parts in the north and south respectively, and there are not a few luxuriant, well-watered oases at the bases of her encircling and bisecting mountains. The forested slopes of the Altai ranges and the northern T'ien Shan, the fertile regions alongside the Manas River in the north and throughout the Tarim River basin in the south, and the numerous dot-like oases in the interior—these form the bases for provincial cities and east-west communications.

103 In early times Chinese often referred to what is now Sinkiang as *Hsi Yü* ("The Western Regions") or as *T'ien-shan-nan-lu* and *T'ien-shan-pei-lu*, i.e., a "Road South of the Heavenly Mountains" and a "Road North of the Heavenly Mountains." These two latter names fitted the natural caravan highways which progressed westward from Chinese Kansu Province on either side of the Heavenly Mountains, weaving along and through the watered and cultivated areas.

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

after crossing four passes between 12,000 and 16,000 feet high and traversing three different valleys sparsely inhabited by Kirghiz, debouches upon the great plain of Central Asia near the flourishing town of Yangi Hissar. The winter route goes north from Tashqurghan over the easy Ulugh Rabat Pass (circ. 13,500 feet) to the Rangkul Pamir, past the beautiful lakes of Little Qarakul and Basikul, and then down through the tremendous gorge of the Gez River which cuts through the Kashgar Range between the great ice-clad massifs of Qungur (25,146 feet) and Chakragil (22,180 feet). It comes out on to the Kashgarian plain at Tashmalik, whence the city is reached in two marches.

Sariqol is about the most unpopular district among Chinese officials in all Eastern Turkistan. Its capital is 10,250 feet above the sea and has a climate which may be described as three months spring and nine months winter; most of the ten days' journey from the nearest civilization has to be performed on horseback instead of in the Peking cart beloved of the travelling Celestial; last but not least, the inhabitants are an unruly lot, very different from the timid and peaceable Turkis of the plains. Small wonder then that the Governor of Chinese Turkistan at Urumchi has the utmost difficulty in finding men for the post. But he does find them, and what is more he removes and replaces them if (as may be expected sometimes in a place so remote from supervision) they misbehave themselves; a fact which throws a remarkable light upon the effectiveness of Governor Yang's control over a district which is no less than two months' journey from his headquarters.

But though the Ambans may regard themselves as Ugolinos condemned to an Inferno of cold, the summer visitor to Tashqurghan will find much that is pleasing in the marvellous clearness and purity of its air, its spacious greensward threaded with pellucid streams and the beautiful shapes of the mountains which stand in glittering ranks all round, yet not too near it. Conspicuous among these is Muz Tagh Ata, "Father of the Ice Mountains," blazing in all its mighty mass of whiteness over the vivid green of the meadows. Though it is 24,388 feet high, the enormous width of Muz Tagh Ata detracts from its beauty as a mountain, and it does not compare for a moment with Rakaposhi or Nanga Parbat; but its very size is impressive, and the vast extent of its snowfields and glaciers, the whiteness of which has an intense

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

quality not seen in lower snows, makes it an impressive spectacle. The wide floor of the Sariqol Valley is dotted with homely little farmsteads, each nestling snugly beside a clump of willows. The soil is remarkably good; wheat, barley and oats sown in May are reaped in October, and two crops of lucerne are usually taken. Sweet-smelling purple orchises, gentians, vetches of all colours and primulas of large size line the paths in June and July.

The Amban of Sariqol, our first acquaintance in the Chinese official world, was not a favourable example of his kind. He was an opium-smoker, and shortly after our arrival at Kashgar was relieved of his post. I called on him my first morning, as I was determined to be polite in spite of his having practically ignored us the previous day. As I arrived only half an hour after the appointed time, nothing was ready, and the Aqsaqal and I had to stand in the waiting-room of the "Yamen" or magistrate's quarters amid an interested crowd of bottle-washers and hangers-on, while a servant hurriedly brought in a small table, two chairs and some uninviting-looking sweetmeats. Finally the Amban came in and we both sat down. Pale green tea tasting strongly of hot water was our tipple; conversation, I regret to say, somewhat flagged, the old Amban being obviously under the influence of opium while my style was cramped by the "gallery" standing close around and following every syllable, every mouthful. I was relieved to be able to escape after twenty minutes or so of this entertainment.

The Amban was in better form when he returned my call the same afternoon, and did his best to make amends for his previous remissness. This encouraged us to invite him, his young son, the Commandant of the Garrison and his adjutant, and the Pir of the Maulais to tea the following afternoon. I found out afterwards that it was a mistake to ask the Pir, as the Chinese seldom sit at table with their subjects. D. spent the whole morning making scones and sweets, and the party was a great success. Conversation flourished, the Amban being quite talkative. He spoke in Chinese to the Adjutant, who translated into Turki to Nadir Beg, who translated into Persian to me and I into English to D. So:—

AMBAN (to Adjutant): How old is the *Tai-tai* (lady)?
ADJUTANT (to Nadir Beg): How old is the *Khanum*?
NADIR BEG (to me): How old is the *Mem-sahiba*?
I (to D.) How old are you?

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

000 use in the same way as the Persian traveller uses his fastest mule; on this animal, called the *abdari* mule, he puts his bedding, his prayer-carpet, his samovar and cups, his water-jug, some food and his personal servant. This is a good plan, for it minimizes the discomfort of arriving at a cheerless *manzil* (stage) long before one's caravan.

No less than four different farewell tea-drinkings at various points along the road leading out of Yarkand delayed our final departure till nearly midday. Two hours' trot-and-canter through a perfectly flat country of wide fields, heavy timber, canals and prosperous-looking farms brought us to the house of a wealthy British subject of Chitral extraction who had a complicated dispute concerning rights of way and water with his next-door neighbour, a Kashmiri colonist. After toying for a while with various dishes and sipping tea, D. went in to see the ladies of the house and I sallied forth with the parties and went over the points in dispute with them on the spot. When I thought that the incessant cross-fire of argument and vociferation from both sides (so like the Indian and so unlike the easy-going Turki) had continued long enough I cut it short by firmly framing issues and referring them to a more or less unwilling committee of greybeards with strict injunctions to submit their decisions on my return from Keriya. No one will be more surprised than myself if well-thought-out replies on all issues are handed in to me by the arbitrators in due course; my hope merely is that the greybeards in question will succeed in bringing about a reconciliation between the parties and thus free themselves from the responsibility of deciding on my issues.

•133 A few miles further on we came to the Yarkand or (as it is called lower down) Tarim River, an interesting stream. Its upper reaches drain some of the most difficult country in the world, the untrodden solitudes of Oprang and the terrible Raskam gorges on the north side of the main Karakoram range; then for a thousand miles it forces its way through the dread Takla Makan Desert, only to lose itself at last in the lakes and marshes of Lop Nor, last remnant of what was once a great Central Asian Sea. In November the various channels can be forded easily on horseback; but the volume both of water and of traffic in summer is shown by the number of large, clumsy ferry-boats one sees pulled up on the beach on both sides of the two main channels.

631 Posgam is a new district which has been carved out of the unwieldy Karghalik charge and placed under a Magistrate of the third class. A Yamen and fine new bazaars are being built of timber by the Chinese to the east of the village. This is only one of several new districts, the formation of which has been necessitated by the increase of population and the spread of cultivation during the last thirty years.

Karghalik, 13th November, 1922.

704 We had a remarkable experience yesterday when two squadrons of cavalry turned out in force to escort us into this town. One of them with its band and numerous banners marched in front of us, 533 and the other with its band and even more banners brought up the rear. The bands both played at the same time, but their repertoire being limited they filled in the gaps by playing scales on their trumpets against one another. Just as the rear band was starting with its

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

When some of the crowd caught sight of our small party trotting quietly over the fields, to our surprise they turned and ran like rabbits; the alarm spread, and the next moment the whole crowd was scattering helter-skelter in all directions. Only a few fierce-looking dogs remained to receive us. Qari quickly realized what the matter was and informed us that we had broken up a dog-fighting meet. I sent Hafiz after the fugitives to tell them not to be frightened of us; gradually they trickled back and soon we were surrounded by a hundred or so sheepish-looking villagers, some of whom led heavily-built crop-eared dogs of the chow type. I thought at first that dog-fighting was forbidden, and that the sportsmen of Domoko had taken us for the arm of the law; but Qari assured me that this was not the case, and that the bolting of the crowd was due to nothing but pure funk. They saw five strangers riding towards them, and their instinct was to run. No wonder a handful of Chinese with a paper army keep perfect order throughout Kashgaria!

I was particularly anxious while at Keriya to obtain a view and if possible a telepanorama of the western end of the Altun Tagh or Mountains of Gold, a range belonging to the Kunlun system and extending from the south-east of Keriya 800 miles in a north-easterly direction. We were indeed vouchsafed a glimpse of the object of our desires, but a tantalizingly premature and inadequate one. In the late afternoon of the 30th November, on the road between Domoko and Qarakir Langar, we caught our breaths at the distant vision of two mighty peaks of the Mountains of Gold, both over 21,000 feet high, 65 miles away over the desert; but the next morning the fatal dust-haze which is far worse here even than at Kashgar had blotted them out, and we did not see them again.

A peculiarity of the Keriya district outside the cultivated area is the coarse grass which covers the country for hundreds of square miles. As there is practically no rainfall at all in this part of the world, these savannahs must be due to comparatively plentiful subsoil water percolating from the distant Kunlun. Chira and Gulakhma and other oases on the road to Keriya owe their existence to this water, which appears in frequent springs after an underground passage of forty or fifty miles beneath the belt of absolutely barren desert between the main road and the villages at the foot of the Kunlun.

There is an end-of-the-world feeling about Keriya which

•133

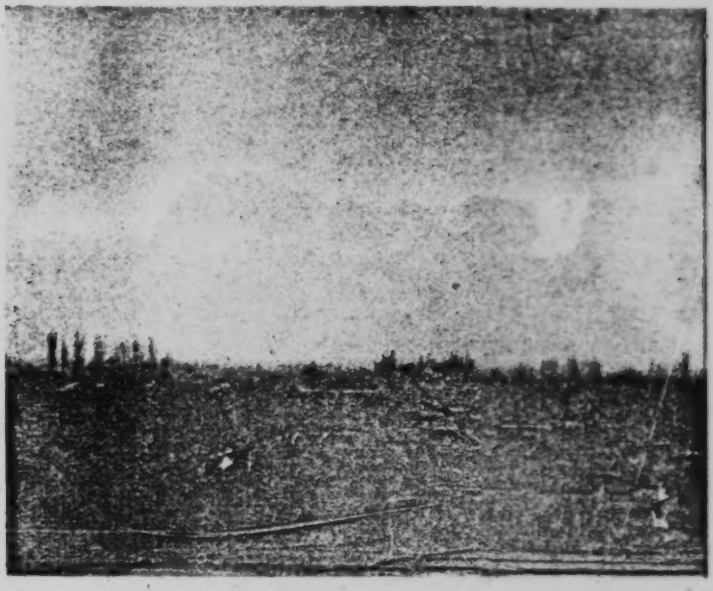
S.W.

PANORAMA FROM NEAR CHĀT, UPPER QARATASH
Elevation 12,500 feet

S.S.W.
ALPS of QUNGUR

QUNGUR II (25,200)

QUNGUR I (25,146)



TELEPANORAMA OF KASHGAR RANGE FROM ¼ MILE S.W. OF KASHG
Elevation *circ.* 4,300 feet. Distance 58–66 miles

[Face p. 116 A]

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

Muz Tagh Ata (under cloud)

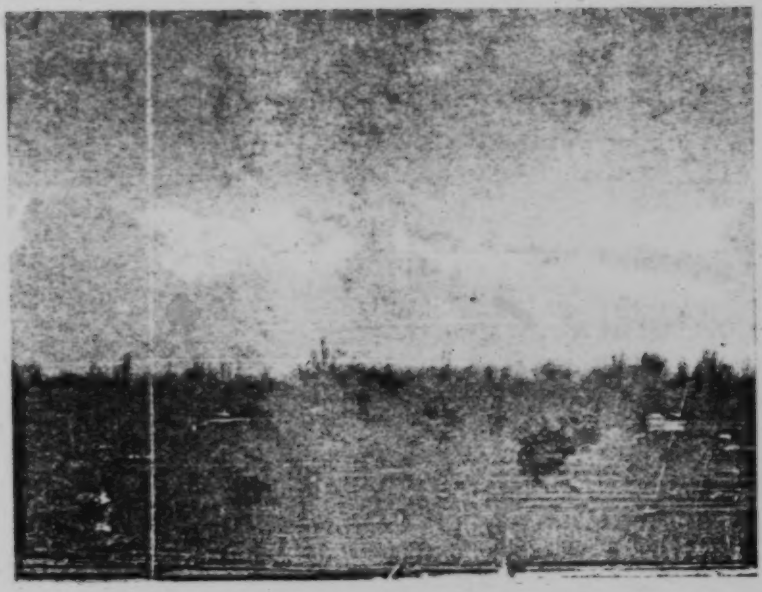
●/23

Upper Qaratash Valley

ATASH

NGUR I (25,140)

Chai



W. OF KASHGAR OLD CITY

Mouth of
(To

[Face p. 116 B]

W.

133

S.W.

CHAKRAGIL MASSIF (22,070)

QARABOKTOR (20,570)

MOUTH OF GEZ DEFILE (To Pamirs)

[Face p.116 C]

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

Qungur II (25,200 — Shiwakte Group

•138

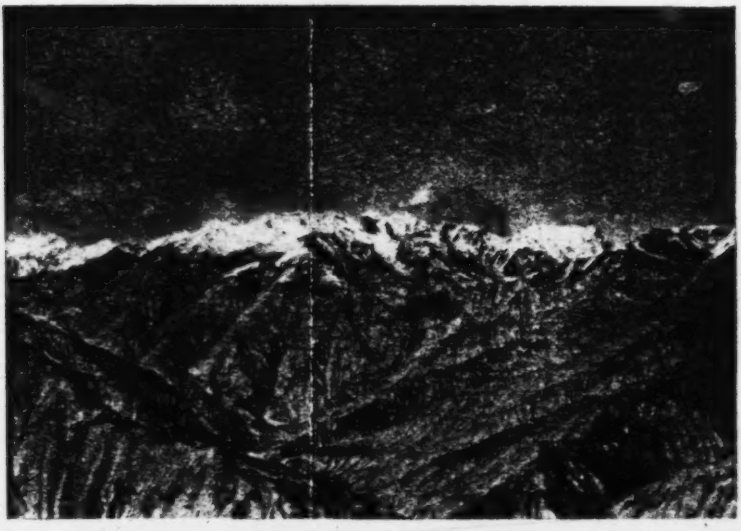
Ulugh Art P. (16,610) W.

[Face p. 116 D]

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

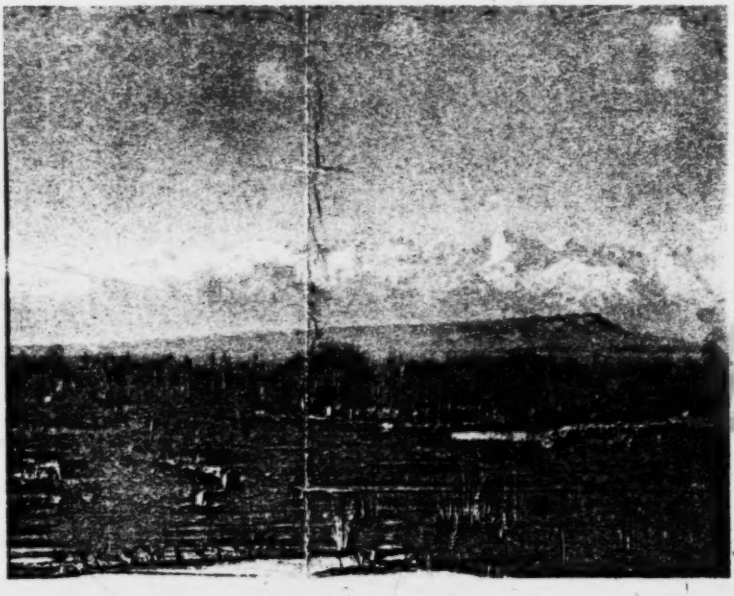
GROUP N.W. ↓ CHIMGHAN RANGE

● 132



↑ JUNCTION OF CHIMGHAN AND QARATASH RS. ↑ JUNCTION OF GHIJAQ AND QARATASH RS.

510) W.S.W. ↓ BOSTAN TEREK MTS. (18,560) ↓



[Face p. 116 E]

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

and went all over the mountains. He seemed a good type of youth, sturdy, cheerful and independent.

The Yai Dōbe plain, on which we now debouched, is a small but perfect example of the inland drainage basins characteristic of Central Asia. Situated at an average elevation of 5,000 feet, it is some 60 miles long by 15-20 broad and is enclosed on the north by one of the parallel ranges of the Tien Shan with peaks up to 13,000 feet, on the south and east by foothills rising to 8,000 feet. It has no outlet, but boasts its own miniature Lop Nor in the shape of a salt lake near its south-eastern corner. Like the *hāmūns* of Persian Baluchistan and Sistan, this lake varies in size according to the rainfall in the mountains, from practically nothing to a sheet of water 40 or 50 square miles in area. The rest of the Yai Dōbe plian is partly barren, partly covered with tamarisks and a sparse forest of desert poplar. Some of these trees attain a great age and size; they are not in the least like poplars, resembling rather the British oak. Here and there in the forest are springs of fresh or slightly brackish water, each with farmsteads or Kirghiz tents in the vicinity. In the spring and autumn the woodland is delightful, but in summer the mosquitos and gadflies for which both it and the Maralbashi jungles to the south are notorious make it uninhabitable by man or beast.

For fifty miles we marched across this curious plain. On September 5 we passed out of the desert-poplar forest and camped the same evening at the springs of Yairam Bulak. Here two families of Kirghiz had pitched their *aq-ois* near a couple of tiny crofts shaded by willows, landmarks for miles in the great sweep of bare plain. We liked the Kirghiz of these hills and got on well with them, but we could not help noticing that they were less hospitable than their cousins of our beloved "Alps of Qungur." They never asked us into their *aq-ois*, nor did they seem to regard us guests as the others (often quite embarassingly) did. It struck me that there might be two reasons for this. In the first place, living on the Russian border, they are at once less secure and more sophisticated. In the second, a trade route much used by Turki merchants passes through their territory; these men, I was told, were in the habit of taking supplies whenever they could and not paying for them. But the Tien Shan Kirghiz could be friendly enough when once their confidence had been gained. The ladies of Yairam Bulak crowded round D., whose

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

But the most curious feature of Old Aqsu appeared next day, when I found my way up one of the winding gullies of the loess bluffs. It is the extraordinary contrast between the two levels, between the land rendered fertile by irrigation from the Qum-Ariq below and the *sai* or gravel desert above. Below, as far as the eye can reach, stretches a rich, heavily-timbered champaign dotted with farms and seamed with irrigation-channels; five minutes' climb up one of the many clefts in the bluff, and you come out on to an absolutely empty desert. Except on those few days when the strangely-corrugated foot-hills and possibly the soaring ice-fields and glaciers of the Tien Shan appear like a vision in the north, half the circle of the horizon is a complete blank, without a bush or a mound to break its perfect smoothness. It is hard to believe that a few minutes ago you were in the midst of a landscape worthy of the brush of Constable or Corot. Some years ago an ambitious Amban sought to gain promotion by bringing a large area of this *sai* under cultivation to the south-east of the Old City. He spent 60,000 taels and much forced labour on deep canals and reservoirs and the construction of a small town of buildings connected with the new water-works. Everything was done with the utmost thoroughness and the scheme was most successful, except that the water would not flow along the canals, which had therefore to be abandoned. To this day the remains of the buildings and waterworks line the road to New Aqsu, clogged with drifts of fine loess dust and dwarfed to insignificance by the immense sweep of the desert behind them.

In Mussulman countries the dead are not as a rule buried in earth that might support the living, and here too the uncultivable (because unirrigable) cliff-tops above the town are covered with domed tombs in seemingly countless myriads. A City of the Dead, in fact, with streets, squares and boulevards complete, overlooks the City of the Living as a perpetual *memento mori*. Looking up from the streets of the town, the domes of the cemeteries crown the bluffs at every point save one; only at the north-west end of the town the ruins of "Amir" Yakub Beg Bedaulat's fortress on one cliff and of his hospital on another, break the serried ranks of the tombs. Bedaulat, knowing no doubt that his day would not last for ever, built his citadel of unbaked brick, and little is left of it though it was abandoned but fifty years ago. The place used to be easily accessible to sight-seers, but the only

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

about and make it the main summer route to Tashqurghan. This would have meant the local people being forced to keep the track in repair, build bridges etc., as well as provide transport for officials using the route. I was interested to hear that two European travellers had been in the valley before, but neither of them had been further than the village of Pilal, 8 miles above Agh Aghzi; although the Oitagh Jilgha is easily accessible compared with the Kaying and other glens of the Alps of Qungur, no European had been to its head or across the Arpa Bel.

On 9th September we continued our march. Seven miles above Agh Aghzi the valley divides, the left or Pilal branch being inhabited by Taghliks and the right or At Oinak branch by Kirghiz. Passing Pilal village with its one immense plane-tree the track led up a wide valley at the head of which towered, incredibly high and blazing white even through the haze, the mighty ice-wall and splintered peaks of Chakragil.[1] Enticing "alps" below the forests of fir which clothed the steep sides of the valley beckoned to us, and we pressed on full of excited anticipation. The villagers had prepared a shepherd's hut for us two miles above Pilal at the mouth of the Arpa Jilgha which, ribbed with forest, led steeply up to the pass. But we would have none of it and camped two miles further up on a delectable meadow among thickets of fir, ash and rowan, perched high above the glacier stream and protected from the noonday sun by high wooded crags and pinnacles of limestone rock. Three *aq-ois* stood on another knoll just beyond and a crystal-clear stream bubbled out of mosses and grass near by. Here we spent three days, all we could spare, exploring the neighbourhood and making friends with the Taghliks.

It did not require a trained observer to realize that the region in which we found ourselves was a perfect paradise alike for the geologist and for the naturalist. Its chief peculiarity is the relatively low elevation of the head of the Oitagh Jilgha. This forms a kind of recess or alcove in the precipitous north-east face of Chakragil, 14,000 feet high, into which the glaciers fall and thus push down their snouts to a much lower level than

[1] This name seems to represent the words *Chikir Ôghil* or "the shepherd station of Chikir." I found a Chikir glen and pastures at the head of the Oitagh, on the north side. Stein gives the name "Chakragil" to the peak at the head of the Bostan Arche valley, some miles to the north-west, which he explored on his third journey. If a name is required for the whole massif, Chakragil would seem the most suitable one.

3: Skrine G-3 (1922-1924) 1926 All Sinkiang All

do those of Qungur. The foot of the Oitagh Glacier is only 8,800 feet above the sea, as against an average of 12,000 feet in the case of the smaller and much less steeply-pitched glaciers of the Qaratash basin. The volume of the Oitagh Glacier is really enormous, but its ice-fall is so steep that the whole glacier is barely 4 miles long. It has several remarkable features. One is its tributary, the Bül Ush, which butts into it from the north-west near its foot, pushing it right across the valley and jamming it against the steep south-western side. A depression about 150 feet deep is thus formed above the bulge, and into this falls the moraine-stream, which travels under the ice for a mile and reappears from a remarkable cave in the black ice of the glacier-foot. Before joining the main glacier, the Bul Ush runs parallel with but about 2,000 feet immediately above it. A series of magnificent water-falls descends from the upper glacier to the lower at this point; one of them is at least 500 feet high and falls clear like the Swiss Staubbach, while another spouts out from a cleft in the cliff like tea from a pot. Yet another feature of the Oitagh glacier is its three parallel lateral moraines, one of which has a double edge with a trough 2–4 feet deep between.

The vegetation of the "alcove" at the head of the Oitagh valley, though of the same Tien Shan type, is altogether richer than that of the Alps of Qungur, doubtless owing to the lower elevation and to the shelter afforded by the tremendous precipices which enclose it on every side but the north-east. We had no rain, but from the appearance of the vegetation, the accounts of the inhabitants and the close proximity of the ice-clad mass of Chakragil I should say that the precipitation is at least as heavy as that of Kaying Bashi. Rowan-trees are more common and have great bunches of berries the size of small cherries: wild currants abound, and the conifers grow more densely if not taller. One fallen giant I measured was 112 feet long.

At the summer grazings the Turki "Taghlik" inhabitants, of Pilal occupy *aq-ois* like the Kirghiz, just as do the Tajiks of Sarikol who are racially totally different from either. They graze all kinds of stock, including yaks, which they breed for the Kashgar meat market, not for riding or milk. The Kashgar military authorities put from 25 to 50 horses out to grass up the valley every summer. The inhabitants of the *jilgha* are assessed for revenue at 500 *charaks* of barley, which can

1: Washington S-4 (no date) 1956 AF13 Northwest China
Sinkiang AI1

133 From the provinces of Kansu and Chinghai northwestward is the former province of Sinkiang, or the New Dominion. The remoteness of Sinkiang from China Proper is emphasized by its size and the physical difficultires. Of the five gigantic mountain ranges in Asia, Sinkiang has three: the Altai, the Tien-shan, and the Kun-lun Mountains. The Tien-shan, or the Celestial Mountain, runs through the middle of the province and divides Sinkiang into two parts - northern Sinkiang and southern Sinkiang. Between the northern slope of the Tien-shan and the southern piedmont of the Altai Mountain, the Dzungarian Basin is located. This is covered by gravels, sands, and pebbles. On the other side of the Tien-shan, the Takla-Makan desert is situated. This part of Sinkiang is called the Tarim Basin. Locally, the Tarim means "the cultivable land." Here the important Tarim River runs along the north edge of the desert eastward to the Lop Nor and furnishes irrigation water to the people who live there. The Kun-lun Range forms a great mountain chain on the southern border of Sinkiang adjacent to the Tibetan Plateau. The topographical features of the province can be divided into five major divisions. They are: the northern mountain region or the Altai division; the Dzungarian Basin; the Tien-shan region; the Tarim Basin; and the Kun-lun region.

The northern mountain region extends from the northern fringe of the Dzungarian Basin to the Mongolian Plateau. The major mountain range in this region is the Altai. In Mongolian altai means "gold." The Altai mountain range is not only the boundary between Sinkiang to the west and Mongolia to the east, but the northern end of the range also functions as the boundary between China to the south and Russia to the north. From China's side, the mountain is not very high and the slopes are relatively gentle. The height is approximately 4,500 feet although a few peaks are about 12,000 feet high. There are a few small plains, for example the Burchun (Pu-er-chin) Plain, which is approximately 1,200 to 1,500 feet above sea level. The plain is formed on the right bank of the Kara Irtis River which originates from the Altai and runs westward to Lake Zaisan.

The Altai mountains are a block faulting structure. Faults appear on both sides of the mountain range. Only the middle part remained stationary as a horst. The ridge goes from the northwest to the southwest and disappears into the Mongolian Gobi. The southern slope of the Altai mountains is dominated by numerous rolling and dome-shaped hills where the Burchun and Urungu Rivers originate. On the southwest side there is a broup of dome-shaped mountains. The Tarbagatai Mountain, where Chuguchak (Ta-cheng) district is located, is the major group of this section. This part is around 2,100 feet above

133 sea-level, and it joins the Burchun plain on the east. The E-min River originates from this group.

The Dzungarian Basin: Dzungaria was the name derived from a Mongolian tribe who lived in this area for a long time. The basin covers the area from the fringes of the Burkan Plateau and the Burchun Plain at the north, the Ili Plain at the west, and the Cheng-hsi Basin to the south, along the piedmont of the Tien-shan. The basin is triangular in shape. The Altai runs from northwest to southeast, so that the east side of the basin is relatively higher than the west side. The surface elevation of the eastern part of the basin is around 1,500 feet, whereas, on the western part, it is only 600 feet in height. All the rivers run from east to west.

The Tien-shan Region: As the Tien-shan range runs from west to east, it separates the province into two sections - southern Sinkiang and northern Sinkiang. The range has been structured by numerous fault blocks; there are many horsts and grabens along both sides of the mountains. Moreover, they vary considerably in height and width and everywhere constitute a strongly marked dividing line between the great basin and the regions to the north. These comprise the wide plateaus of Dzungaria, stretching north to the fringe of the basin with a few well-irrigated, but isolated, areas and fertile plains and valleys. They do not, however, form any regular system and pattern. Since there is adequate moisture, [241] agriculture is to be found both in the valleys and on the plains, especially in the Ili Valley and on the Fou-kang Plain. Farther north on the northern slope of the ranges, grazing land is found. It has, at all times, attracted waves of nomadic nations, from the Huns to the Kazakhs and the Mongols. The continuity of its rampart, the Tien-shan range, offers opportunities to [487] nomadic neighbors on the north for plundering the oases and and trade routes in the south, since the mountain rampart is pierced at intervals by passes which are passable for mounted men and transport during a considerable portion of the year. To the southwest of the Turfan depression the wide valley of Karashahr descends from the grazing plateaus of Yulduz. It always has served as an open gate for nomadic inroads in the northwestern corner of the Tarim Basin. Farther to the west, under corresponding conditions, the great oases of Kucha and Kashgar are equally liable to attack across the Tienshan. The Tien-shan Region is the most important division in the province, because it occupies almost one-fourth of the provincial territory and there are many major cities and oases located on both sides of the ranges.

The Tarim Basin: This is the huge desert area between the

133 Tien-shan on the north and the Kun-lun Mountain range on the south. Generally speaking, this area can be divided into three sections: namely, the core desert area, the piedmont alluvial fans, and the isolated oases. In the core area of the Takla Makan Desert, the absence of moisture bars all animal [361] and plant life. In the alluvial fans at the piedmonts of Tien-shan and the Kun-lun there are settlements and towns. However, they are rather widely separated. The alluvial fans [130] are not all alike. In the higher plateaus of the southern fringe of the Takla-Makan near the Kun-lun ranges vegetation is to be found only at great elevations where the proximity of glaciers provides moisture and allows vegetation to grow for a few months of the year. It also is found in the extremely confined spaces that streams fed by these glaciers leave at the bottom of deep-cut, narrow gorges. Oases are strung singly like a chain, especially along the fringe of the southwestern corner of the Takla Makan desert. They are generally located between the hilly land and the desert and are of different sizes and conformations, depending upon the local relief.

The basin itself is higher on the southwestern corner, near the massive mountain ranges of the Pamirs. The elevation of this part of the basin is around 4,500 to 4,800 feet. It inclines gently towards the east and northeast, where the elevation is around 3,600 feet. Thus, the rivers run from the southwestern mountainous area, along the edge of the Takla Makan and toward the east. East of the Takla Makan is the oval depression of the Lop Nor where the Tarim River ends.

The structure of the basin is that of a depressed part of the Kun-lun range. The southern edge is higher than the northern edge, revealing that the southern edge of the basin was joined with the hilly land of the lower part of the Kun-lun range.

The Kun-lun Region: On the southern flank of the Tarim Basin the Kun-lun range extends in an unbroken line. It starts from the "roof of Asia" - the Pamirs - and forms a gigantic and massive feature of the southern border between Sinkiang and the Tibetan Plateau on the south. On this range lies the watershed between the drainage areas of the Oxus and the Tarim Rivers. East of the Pamirs it separates into several high parallel ranges. These ranges are cut by the Yarkand River and its tributaries, the main feeders of the Tarim. At an elevation of some 16,500 feet above sea level there is the Kara-koram pass, which is the only practicable means of access to Ladak and the uppermost Indus Valley. Farther to the east, the Kun-lun raises a practically impenetrable barrier to any sort of traffic. The two rivers which water the Khotan oasis break through the northernmost main range, but their passage ends largely through extremely deep-cut and generally quite

S
133 inaccessible gorges. To the south of the point where the terminal course of the Tarim turns and dies away in the marshes of Lop Nor, the mountains resume an easterly bearing and sink to a lower level. Beyond the eastern extremity of the Tarim Basin, the Kun-lun imperceptibly merges with the Ch'i-lien-shan along the southern edge of the Kansu Corridor. In the western portion its northern slopes, with their aridity and far advanced erosion, closely reporduce the physical features already familiar to us from the Kun-lun. The other branch extends eastward to Chinghai Province, forming the divide of the Yangtze and the Yellow Rivers.

Examination of the topographical features of northwestern China reveals that mountains, plateaus, deserts, and gravels dominate the land forms of the whole area. Level land is present along the various river banks; notably, the Ili Plain, the E-min Plain, the Kara-Irtis Plain, the Urumchi Plain, and at certain portions of the Tarim River. Human activities are largely restricted and limited by the unfavorable topography
S
[361] and land forms. Cities are located at the piedmonts of the mountains, and oases are situated along the outer fringes of
S
[161] the deserts by the side of water. The population of Northwest China is sparsely distributed through the whole section .

N
132 C. Climate

Particularly in Northwest China, where the great portion of the land is dry and sandy, the success and well-being of the whole agricultural population is bound up with the amount of rainfall, its seasonal distribution, and its reliability. Temperature, which in winter absolutely stops outside activities with its cold and which destroys crops through untimely frosts in spring and fall is next in importance.

The inland provinces of Northwest China are least influenced by ocean winds from the southeast and east, and the continentality is very obvious. The climate of Northwest China undergoes sharp fluctuations of temperature in summer and in winter, and uneven and unpredictable precipitation throughout the year.

According to collected data on temperatures from a few stations in Northwest China, Chiu-ch'uan for instance, the average temperature of January is minus nine degrees Centigrade. Tun-huang is minus seven degrees Centigrade. Because of a lower elevation than Chiu-ch'uan, Tun-huang is relatively warmer even though farther west. In July, Chiu-ch'uan has 23.8 degrees Centigrade, whereas Tun-huang has 27.1 degrees Centigrade. The annual differences of each of the stations in Kansu are over thirty degrees Centigrade. Chiu-ch'uan is thirty-three degrees Centigrade; Tun-huang is

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315 now enable Yü-men to produce eighteen percent more heavy
[433] lubricating oil and fifteen percent more kerosene. (NCNA April 22, 1955).

Numerous new oil-bearing structures and seepages have recently been discovered around Wu-chung, Ku-yüan, Hua-ting and some other districts in Eastern Kansu province. A recent report stated that preparations are now being made to drill a deep test well on the biggest structure which extends over 120 square kilometers around Wu-chung. (See Table II.) 1

S
315 Oil Development in Sinkiang:
[135] To the west of Kansu lies Sinkiang, a province rich in minerals, particularly oil. Recent prospecting reveals that Sinkiang has excellent oil possibilities.

There are two basins, the Dzungarian in the north and the Tarim in the south. Seepages have been found in both and the prospects of finding petroleum are good. The Dzungarian Basin is enclosed between the Tien-shan Range on the south and the Altai mountains in the north. Seepages are reported at Ching-shih-hsia near Chuguchak (Tarbagatai or Ta-cheng) (46.45 by 83.40), near Kuldja (Ili or Ining) 43.48 by 81.17), at a place southwest of Sui-lai (44.21 by 86.19) and at Urumchi (Tihua) (43.48 by 87.36). The Tu-shan-tzu field is about five miles southeast of Wu-su, (location approximately 44.15 by 85.0). In the district of Wu-su there are also oil seepages at Ssu-su-mu, Chiang-chun-kou, An-chih-hai-ho, and Ta-shih-tan.

The Tarim Basin lies south of the Tien shan and north of the Kunlun and Altyn Tagh mountains in southern Sinkiang. It is occupied by the great Takla Makan Desert, one of the most barren spots on earth. A small, undeveloped oil field is said to exist at Hei-tzu-erh-po near Kashgar (39.27 by 75.59), and there are oil seepages at Su-ta-che, Shui-mo-kou, Tun-ho, Ssu-cha-kou, Wensu Aksu (41.06 by 79.58), at Shang Wu-pu in Sha-che, Yarkand, Hsiao-kuai in Sha-wan and at Kucha (41.40 by 83.04). From the geological formation, which consists of a thick series of Tertiary strata containing marine Eocene beds in the western part of the basin and which underlie the basin, it is thought that the oil possibilities are good. Much work will have to be done to map the structures.

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Drilling has been started at Hung-tung-shan in Kucha, at Hsi-ho in Tarbagatai (T-cheng), Tu-shan-tzu south of Wu-su, Urumchi, Turfan, and Kashgar (Shu-leh). Petroleum is obtained to the west of Urumchi, where the oil is scooped from the surface of water with buckets. The petroleum is of black color. Petroleum can also be found from Shih-ho to Manas in the Urkashar Mountains, and also between the caravan stations of Kurtu Anchihai-ho in the district of Wu-su. The richest

1. [See p. 128--Analyst]

315 petroleum resources are between the last two stations extending in a north-south direction with a length of forty miles; the petroleum is yellow and easy to refine. The oil from Sinkiang is reportedly of better quality than that found in other provinces in the Northwest of China. One of the main centers of petroleum exploitation is at Tu-shan-tzu, five miles south east of Wu-su, on the Western Highway of Urumchi; there exist wells over 2,275 meters in depth.

[133] The intermittent Tertiary oil sands are said to lie between a light green shale above, and the sandstone below. No record of the drilled stratographic sections is available. The Sinkiang [648] provincial authorities employed two Russian drilling experts, and in 1935 they began to test the field with modern drilling rigs. Some time later the Russians took over the project and after 1939 increased their efforts to develop a producing field safe from enemy action. In 1942, only three or four of the seventeen known wells drilled were producing, and only one was [433] flowing, the others being pubped. Yield was said to be ten to thirty tons per well per day. Other wells were being drilled, but it is not known how many were completed. In 1943 there [648] was some disagreement between the Soviet and Chinese Governments and the Russians left the field. In August, 1944, an [433] American oil man visited the field and reported that the Chinese had uncapped six producing wells and were producing about fifty tons of crude oil a day. The wet gas was wasted as there was no equipment for saving it. The oil is thought to have a paraffin base, similar to that of Kansu. Sample distillation gives nineteen percent gasoline, twenty-three percent kerosene, and the remainder, black oil and residue.

At Tu-shan-tzu in Wu-su, there are more than thirty oil wells being drilled. There is a fairly good refinery which makes it the best oil-producing center of Sinkiang. In addition to gasoline and kerosene, it produces lubricating oil for airplanes.

At Taklak small oil wells are drilled by the natives along the Kun Alik Range to the south east of Taklak in Wen-su, northwest of Aksu. The natives work on a small scale during the Spring, Summer, and Autumn. At Hung-kou and An-chiu, southeast of Wu-chia, oil wells were drilled in the late 1940's, but no oil is produced in Hung-kou, although the natives extract some paraffin wax from the oil sands. However, oil is obtained from the well in An-chiu, but the output was only two to three gallons a day in 1949-50. (See Table III.)

315 654 Oil prospecting teams were sent to Sinkiang by the Northwest Geology Bureau under the Ministry of Geology in early 1955. They went to the Turfan and Dzungaria Basins (as well as Tsaidam of Chinghai province) to locate oil bearing structures,

1. [See p. 129--Analyst]

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AGRICULTURE AND LIVESTOCK

I. The Pre-Communist Period

A. Introduction

Since the Chinese Communist Party came to power, its interest in the Northwest, as an area for economic development, has increased. The Communists feel that this vast region of 1,232,074 square miles, which is roughly one-third of the total area of China (3,657,765 square miles), offers unlimited opportunities for economic development. They claim that vast mineral deposits exist, that agriculture can be greatly expanded, and that the Northwest might serve as an outlet for some of the heavily populated sections of China Proper. Of China's total population of 582,605,000 million people, only 35,360,000 reside in the Northwest (Shensi: 15,881,000; Kansu and Ninghsia: 12,928,000; Chinghai: 1,677,000; and Sinkiang: 6,874,000). These figures are from the 1953 census report.

Since 1949, the Communists have begun to develop this area as rapidly as their limited capital and technological resources permit. Though the development of agriculture is only one aspect of their program, it is the foundation on which Communist planning in the Northwest rests.

B. Sinkiang

1. The geographical setting

Sinkiang is enclosed on the north, south, and west by mighty mountain masses and on the eastern side by wide stretches of barren plateau and is bisected by the lofty Tienshan, or Heavenly Mountains, which rise to heights of 23,000 feet and extend across the province from west to east, dividing the region into two unequal parts. The southern area, two-thirds of the whole, is the Tarim Basin, the land of oases and deserts. The northern part is Dsungaria, traditionally the land of the nomads. The total area of the province is about 600,000 square miles, or twice the size of Texas.

In the Tarim Basin, named from the east flowing river of the same name, is one of the world's driest deserts, the Takla Makan, which at its lowest point is actually below sea level. Vegetation is almost non-existent, so that nomadism is impossible except on a few alluvial fans where water lies near enough to the surface to support grass. The average rainfall is less than four inches a year. Water comes from the mountains which fringe the desert on the north, west and south. From the melting upland snows and glaciers, rivers cut their way down to the central oval desert. Where each river leaves the foothills, men dig canals to spread the water out in a fan, forming an oasis, so that the edige of the desert along the foot of the mountains is dotted by a series of oases.

oases. A trade road, looping around the desert, links the oases like beads on a string, forming a U with the open end toward the east.

Dsungaria is in northern Sinkiang, between the Tienshan and the Altai mountains which mark the frontier between Sinkiang and Western Mongolia. Precipitation here is slightly higher, and steppe vegetation makes pastoralism possible. Northern Dsungaria was the avenue of migration followed by the Mongols in their westward conquests.

2. Pastoral nomadism

In 1943, there were 11,720,000 sheep and goats in Sinkiang, 1,550,000 cattle, 870,000 horses, and 90,000 camels, totalling 14,230,000. In 1947 the province reported 12,266,000 sheep and goats, 1,659,000 cattle, 1,027,000 horses, and 85,000 camels, a total of 15,037,000. The total has remained somewhat constant over a period of time, probably due to the fact that pasture land is poor and care of the herds inadequate. Most of the livestock are in Dsungaria, pastured in the steppe land by nomad Kazakhs or Mongols. There are many variations to the techniques of herding animals since cattle, horses, and camels each prosper best on different kinds of pasture. The problem is to devise the best combinations of animals to be maintained and to select the appropriate pasture, decide how long to remain on a pasture, when to move, and how.

3. Oasis agriculture

There are two kinds of oases in Sinkiang: those in the south, which are sharply isolated from each other by desert stretches and the oases of the north, which have fringes of land in which rainfall farming prevails. When irrigation was introduced, it seems to have been practiced first on the lower courses of the rivers, where the soil was soft and the engineering problems required only the digging of simple ditches from the banks of the streams. In the course of time, as knowledge of engineering developed, the tendency was for the oasis to move upstream toward the boulder slopes at the edge of the foothills, but not back into the gorges where the problems were far too great.

Oasis engineering is extremely simple. The basic pattern is a main canal from the river, branching into smaller canals which branch in turn into ditches which deliver water to the fields, all arranged so that water flows by gravity from level to level, without the pumping or bailing devices which are widely used in China and in Soviet Turkestan to lift water from lower to higher levels.

In volume of discharge, the rivers of the Tarim system are far behind the two great rivers of Soviet Inner Asia, the Syr Darya and the Amu Darya. The total discharge of all streams in Sinkiang is about 3400 cubic meters per second, of which about seventy per cent is in the Tarim Basin. In irrigation engineering

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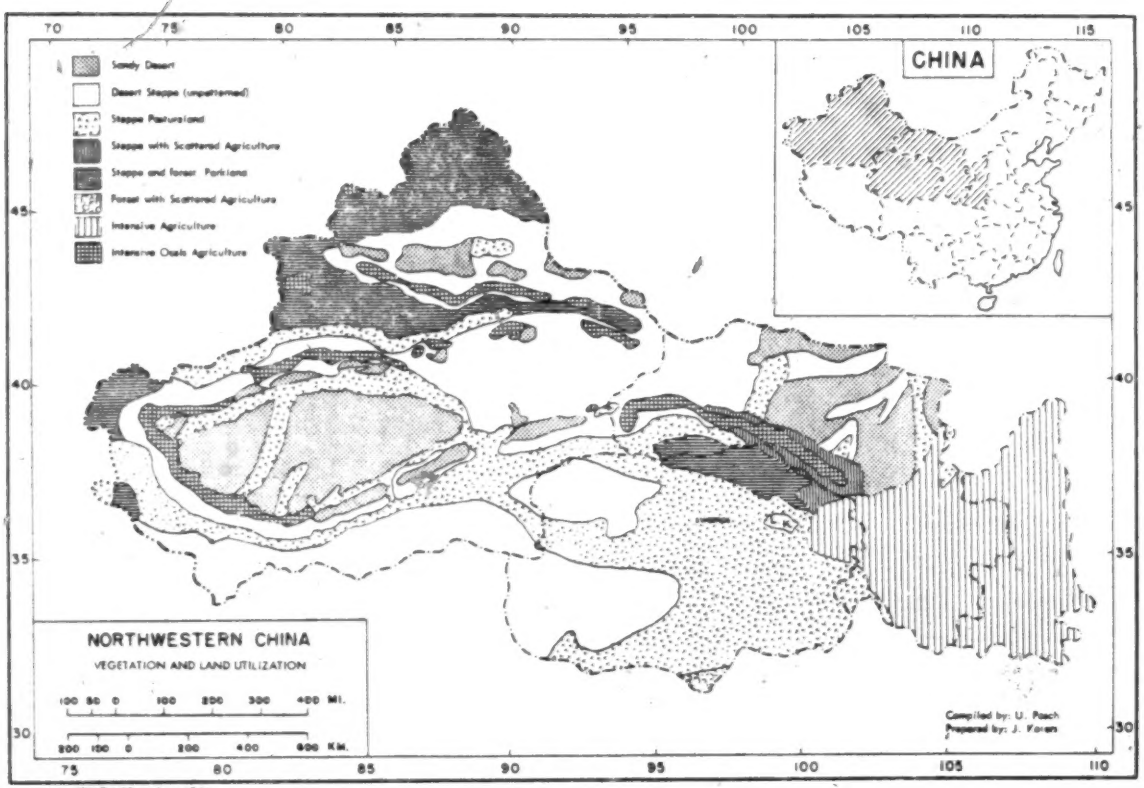

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no further trouble in the inn from inquisitive onlookers. We hung a curtain at our door and no one ventured to lift it.

The aspect of Hsinghsinghsia was very remarkable. It is a narrow ravine between massive rocks. All these were of sombre colour and forbidding outline, some being veined with long streaks of white granite, which traversed them just as forked-lightning appears to rend an ink-black sky. The lower portion of the rocks was worn by the waters of some ancient river, and an old tablet records that 'In this place baboons were wont to come to drink,' hence the name 'The Ravine of Baboons.' The only object of historical interest was the grave of a Mahommedan saint, whose tomb was cut in the solid rock. It was sealed, but hearing that we wished to see it, a sergeant broke the seals and allowed us to enter. The sepulchre dated from the Han dynasty, in the early days of the Christian era, and is believed by the faithful to hold an empty tomb, the holy man, whose name was Kai, having come to life again and passed elsewhere. In the Chinese temple the Taoist priest showed us with pride a fine specimen of quartz, which he had procured from a neighbouring hill. The name of Hsinghsinghsia, by the alteration of a character without changing the sound, may also be read 'The Starry Pass,' and the two names are used interchangeably. This quartz he called the 'Star Stone' and the hill from which it is taken 'Starry Mountain.' It glitters in the moonlight like a thousand twinkling stars.

As the evangelistic services continued we became very friendly with the men, from whom we heard many tragic stories. One boy of sixteen had been on his way from his home in Yungchang, Kansu, to an uncle, who had a business in Hami. 'My mother is a widow and I

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'The Governor declares,' read the officer, who this morning was in a flattering mood, 'that the three ladies, Feng Precious Pearl, Feng Polished Jade, and Kai All Brave, are people of the highest reputation, and therefore they, their escort and baggage, are permitted to enter Turkestan without delay.'

There was great lamentation in the garrison when the men saw us preparing to leave. 'They say that next week we shall get our pay, and if this be true we would have bought all your remaining books!' The gaming tables were abandoned as the crowd gathered to say good-bye and wish us good luck, and as we left the ravine an orderly appeared carrying a handful of vegetables—two cucumbers and a melon—from the officer's wife. The supply of these luxuries from Hami being very limited this gift represented a whole day's ration for her household.

It was with a delightful sense of freedom that we emerged from the 'Ravine of the Baboons' and took the desert path once more. We had left the grey and black pebbles of the Black Gobi behind us on the south side of the ravine, and we now came out into a most interesting and varied country. Granite hills surrounded us, and frequently the carts had to be dragged over immense slabs. The soil in places was red; the outlines of the ranges of hills were bare and rugged, while their colouring was as delicate as it was remarkable. Blue, purple, green and grey stretches of rock lay all around us, and as sun and shadow played on them the whole landscape was iridescent with the tones of the rainbow. We also passed at the very foot of the Starry Mountain, and there delayed a few minutes so as to fill our hands with the glittering fragments of quartz. At the base of the granite rocks were excavated holes, large enough to admit the entrance of a man's body, and

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Ansi, and our own exhilaration was shared by the whole cavalcade. The tired mules shook their heads as they smelt the cool verdure, while the carter explained: 'Now our troubles are all over! We have come to sweet water!' Several of the inns were full, but we finally got rooms in a seemingly abandoned courtyard. The landlord was away from home, but a good deal of knocking brought his wife from her bed, and she consented to receive us. In a few minutes the sheep-dung fire was glowing, the water boiling, and we were drinking an ambrosial infusion-tea made with 'sweet water.'

A good number of families inhabited this oasis[1], and we were now sufficiently far from the Kansu frontier for the normal conditions of travel and business to obtain once more. The various inn yards were full of peasants' carts bringing produce from Hami, and we were also able to buy fresh vegetables and a melon. We sat for several hours in the shade of the trees by the bubbling spring, talking with the women who came there to draw water. It was a restful spot, and it was with regret that we left it. The next dawn brought us to Hwanglukang—'The Hill of Yellow Reeds.' Here the character of the country changed, the village being situated in the midst of rolling steppes, where tall grass supplied abundant provender for cattle. In this place we saw the cattle all kneeling before tussocks of coarse grass which they had worn down to smooth hummocks with the rubbing of their necks. The appearance was very strange and gave the impression of an act of worship. In the afternoon we wandered out to see the village and its inhabitants, calling at the Mosque, where we found a venerable Ahung—courteous, dignified and friendly—surrounded by a group of little boys, to whom he was teaching the Koran. They were

1 [Changliushui -- Analyst

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the sons of the Turki families in the neighbourhood, but the innkeepers were still mostly Chinese.

It was here[1] that we experienced the one serious mishap of our journey. One of the carters had volunteered to cook the dinner, and having espied round the well-mouth a thick growth of toadstools, privately decided to flavour the *mien* with them. Luckily for us the experiment, from a culinary point of view, was a failure. The gravy in which the macaroni floated was grey, slimy, and carried globules of oil on its surface, being besides nauseous to the taste. In consequence we ate but little, and one of the party finding a fragment of what she took to be a mushroom in her bowl, removed it with her chopsticks and cast it on to the rubbish heap which lay in a corner of the room. Another, less wise, ate her portion without question, and an hour later was taken exceedingly ill, so that for some hours we wondered how things would go with her. By evening, however, the symptoms abated, and she gradually recovered. Others of the party were also affected, but less seriously.

It was consequently with a renewed sense of gratitude to Almighty God that we moved on to Yükoshu—'The Elms'—where by the side of the village pond we found a spacious and empty inn, clean and comfortable, where a quiet night did wonders in restoring strength. We were now only seventeen miles from the town of Hami, and next morning we started early, all excitement at the thought of being soon in that ancient and renowned city. We travelled first over an undulating grassy plain, and later on through a belt of sand. We had only gone two miles when we saw the Chinese Evangelist, who had gone on ahead, galloping back towards us and riding a strange horse. To our amazement he brought the news that Mr. Hunter (whom we believed

[1] [Changliushui--Analyst]

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Hami is by far the largest and most fertile oasis through which we had passed. For six miles before we sighted the town we were travelling in highly-cultivated land, abundantly watered, and between fields of wheat, cotton, millet, maize and sorgum. Approaching the town we passed through a fine avenue of trees; the sky overhead was cloudless, and in the background the snow-peaks of the Karlik Tagh Range glittered in the sunshine. At that moment a group of girls in long scarlet dresses and flowing white veils came running down the road chasing a herd of unruly donkeys. They gave the last touch to a brilliant scene of prosperity and riotous colour.

CHAPTER XXXVI

THE WONDERFUL CITY OF HAMI

THE beauties of Hami exceeded all our expectations, high as these had been. The inn in which we stayed was situated in the large, unwalled, commercial area of the town, and the landlord was a wealthy Moslem Turki. When our drivers turned into the spacious, open courtyard bordered with well-kept flower-beds, and surrounded by rows of well-built rooms, we could scarcely credit that this was the 'inn' of which Mr. Hunter had spoken so modestly. A suite of three rooms, communicating by inner doors, was allotted us, and we found that we were the first tenants to occupy them. The windows were newly papered, and with a fresh, clean matting on the *kang* all was spotlessly clean. There was no stabling provided, however, so after unlading, our drivers, carts, and mules departed to another inn of a more ordinary type. We had the

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indicate. The former lies across Chinese Turkestan to the south of the Tian Shan Range, passing by Kuche and Aksu to Kashgar; the latter, cutting through the Tian Shan Range, runs along its northern side, through Urumchi to the Ili Valley and Kulja. It was this latter route that we followed.

Our cart was returned by the wheelwright fitted with splendid new wheels, the mules were rested, and all promised well for the next lap of the trail. A Chinese traveller's proverb speaks of the long journey from Suchow to Hami as 'unmitigated bitterness,' and of that which still lay before us as a medium between the 'bitter and the sweet.' Certain it was that we had reached the end of most of the brackish water oases, and we found that the plain which now lay before us was, in most places, duly supplied with springs and wells of sweet water. The three halts beyond Hami are known as 'the First, Second, and Third Stops,' and the traveller is expected to do the three stages at a pull. However, after eleven hours we only reached the second halt, and refused to go further. The first night-stage on leaving a resting-place was always particularly trying, coming as it did after a busy day of final preparations and farewell calls. There was no possibility of rest by day or by night, and at the end of twenty-four hours we were always dead beat.

'Second Halt' was an attractive place, watered by a rushing stream. The village was much larger than those south of Hami, and there were apple trees laden with nearly ripe fruit hanging over the walls of the farms. After some hours of sleep, we got up to find the courtyard invaded by a band of men travelling from their homes in Shansi to their business in Kucheng. They were all employees of a large firm, and by the terms of their agreement were allowed to visit Shansi

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133 312 The next dawn found us at a beautiful spot called Yatzchüan—'The Duck Pond.' It held a 'living spring,' that is to say, one in which the water is in constant motion, welling up from the sandy bed, sometimes with such force as to set the whole pond in ebullition. Every few minutes the depths were strongly disturbed, and a trembling column of sand would rise to the surface and then break in large bubbles. The oases through which we were passing were fed by the same water supply as that which irrigated the fields of Hami. It has been pointed out that the traveller must not allow himself to be deceived by the long, continuous blue line, indicating the flow of imaginary rivers connecting the ranges of the Barkul mountains and Karlik Tagh with visionary lakes. As a matter of fact, the water from the melted snows is lost in the gravel soil at the foot of these ranges, but reappears many miles away in such living springs as that by which we rested, or in a saline well in some depression of the desert. The Khan of Hami owns a house at this place, in which he stays when travelling on official business, and the caretaker allowed us the use of his rooms. They were clean and comfortable, but as bare as an inn. Near the front gate was his private mosque, decorated with a picture of Mecca. These buildings were throughout of mud, but the outer walls were yellow-washed, with a view of giving to the whole an imperial aspect.

133 [185] On leaving the 'Duck Pond' we drove for twelve hours on a long, arid, stony, uphill stage, and shortly after sunrise arrived at an isolated inn. For several days each stage had brought us nearer to the foothills of the Barkul Range, and here we were so close that only three days' journey north-east divided us from the town and lake of Barkul, both of which lie on the other side of the Range. In these mountains are herds of wild

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asses and of bronchos, reputed to be untameable. We were now at an altitude of 5500 feet, and on the edge of a bare plateau overlooking a depression to the south, from which a road led off in the direction of Turfan. It was an ancient road, now in disuse, being considered too dangerous for caravans. The wind blows down this valley with such tremendous force that whole caravans have perished, the carts being blown to pieces and the men and beasts overwhelmed by the whirling sand. The innkeeper pointed out a spot called San Chien Fangtz—'The Three Rooms'—where eighteen carts laden with silver are said to have totally vanished. Acting as servant to this innkeeper was a young man who greeted us with sheepish cordiality. 'You got away all right from Hsinghsinghsia,' he said, and he proved to be one of the men who had escaped on the rainy night of our stay there, and who had not been recaptured.

Leaving that afternoon, we saw a lizard differing from any we had met with in other parts of the desert. It was about one and a half feet long, and was too quick for the carters, who chased it with their whips but failed to catch it. Continuing uphill between rocks, granite boulders, and volcanic slopes, over a stony road, we reached Chekuluchüan—'Cart Wheel Halt.' Of the three inns which formed this hamlet, two were untenanted and the third was badly broken down. Some of the rooms were roofless, while in others large holes had appeared in the walls, but having accomplished the short stage we were thankful to get rather longer hours of sleep than usual, and felt greatly refreshed by the cooler air of this quiet spot. The little row of inns stood in a gorge between stony hills, and the force of the gales through the narrow ravine was so great as to have worn the rocks into hollows, in the depths of which

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birds had made their nests. This was the most striking example of wind erosion that we saw.

This last stage had been taken in company with Mr. Hunter, whose little cart frequently made better stages than our heavy vehicles could manage. At this point we were all needing small repairs to our carts, and also the stony roads had become very heavy on the shoes of our teams, but Mr. Hunter now produced a travelling farrier's outfit, and with the help of his man shod the mules, greatly to the admiration of the Chinese by-standers, who commented freely on the resourcefulness of this experienced traveller. Mr. Hunter's man was a Mongolian youth, called 'Nimga.' The Living Buddha, to whom he was subject, had given him as an orphan boy to the missionaries. He always slept where he could watch the horses, and on one occasion, when he felt certain that horse-stealers were prowling around, lay down on a horse's back and slept there. His horsemanship was splendid, accustomed as he was to riding from infancy.

The Turki innkeeper, a tall, lean, bearded Moslem, looked with some suspicion at this party of foreigners. 'What have they come for?' he asked Mr. Hunter. 'Is it bones, plants or game that they want?' 'Nothing of the kind,' was the answer, 'these are missionaries.' 'Oh, that's different,' he grunted, 'but some of those who come, why there's no knowing what they want! There was a man here once upon a time, and his servant told me that he came to Chekulu in order to measure the distance to the sun! A likely tale! Couldn't he measure it in his own country? Surely you can *sometimes* see the sun in Western lands?'

For four hours that evening we descended a smooth, downhill road, and on reaching the plain entered a sandy basin about twenty miles across, the lower part

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372 qualities. S[illegible] of the desert plants and roots supply fuel of fair quality, but in most places the people are dependent on animal droppings, cow dung being the best variety since, well dried, it gives out a glowing heat.

647 A visit to the Official brought us once more into the tragic conditions of Yamen life. A young man, with signs of the opium habit upon him, received us with the usual Chinese courtesy, and introduced his wife, who was a nice-looking and self-respecting girl; but there were other women in the household of such a character as must have made existence in Tsikioking a living death to her.

CHAPTER XXXIX

THROUGH THE CELESTIAL MOUNTAINS

• 133 491 At Tsikioking we were within a few miles of the outer foothills of the Tian Shan, which, on the next stage, we were to traverse from south to north. No sign of the Pass, however, was evident, and it was not until we had covered the first few miles of gently rising ground that we found the road took a sudden turn, and we then quickly entered the mouth of a narrowing gorge. At the entrance to the ravine the yellow sand was piled up on the windward side of the rocks to the height of several hundred feet, but as we advanced naked blackness met the eye on every side, and from here on, a rift through the black rocks sliced a road right across the Celestial Range to the plain of Dzungaria.

For nine hours we followed a narrow path, the gradient rising so evenly as to be scarcely noticeable. The high rocks on either side were absolutely denuded,

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and of perpendicular strata. Great naked crags towered above us, and in some parts the side of the mountain was cut clean through as with a gigantic knife. Our previous experience of mountain passes had led us to expect a road which must rise and fall with the course of the mountain, and we were greatly astonished when, hour after hour, we still pursued a course with no semblance of a hill. The rugged grandeur of the scene was most impressive. On either side the loose boulders were flung in wild confusion, though never blocking the path so as to make it impassable to the carts.

As the night wore on the constant winding of the Pass, in which we could never see more than a few hundred feet ahead owing to its tortuous nature, made the stage seem interminable. It appeared as though, after so many hours, the next turn *must* bring an opening to view, but once again the road twisted and vanished round yet another corner. Suddenly, without warning, we emerged, and saw in the brilliant moonlight the inn of Towshui—' Head Spring '—which was a welcome sight indeed.

During the winter months this gorge is closed by the snow, and many travellers have been lost in the drifts caused by the sweeping of the winds round the sharp corners ; the optional road via Turfan has then to be taken. The only signs of life in these desolate, barren, stony chasms were the birds of prey which hovered overhead. A Chinese traveller told us that once, when eating a wayside lunch in the gorge, he turned his head aside for an instant, and like lightning an eagle swept past, taking the bread from his hand.

From Towshui to the next inn, which is Tashitow—' The Great Stone '—the road led over the watershed dividing Chinese Turkestan from Dzungaria. We drove over undulating downs, and as we descended the other

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133 491 slope met some rough descents over granite slabs. As we gradually came in view of the northern slopes of the Tian Shan we found the barren, stony face, typical of the south side of this range, exchanged for wooded slopes, while the sandy wastes gave way to short, grassy turf and scrub.

361 487 Tashitow, though small, is a place of some importance. Geographically its position is notable, standing as it does on the Dzungarian slopes of the great watershed. From here also is a foot-track to Barkul, and a short cut over the mountains to Turfan, whilst yet another road leads in fifteen days to Uliassutai. It boasts three inns, and a temple with a lake and spring of water, which though sweet was very turbid. The temple is built against a bare rock of a shining black formation, as though it had been polished with blacklead. We 491 followed a good road from Tashitow past Sankochüan—'Three Springs'—to Muleiho—'Stacked Wood Stream.' 361 It was midnight on Friday when we reached this town, where we were to spend Sunday. We passed down a long street between closed shops, under the frontage of which lay sleeping merchants, doubtless unable to endure the heat of the rooms. Mr. Hunter was ahead of us, and Nimga was waiting to direct us to our inn, which was the only one where rooms were available. He carried in his hand a great bunch of the small, seedless grapes from Turfan—a welcome sight, for we 485 had tasted no fruit since Hami. The inn court, as well as the street, was full of sleeping men, and the landlord's welcome was far from encouraging: 'There are rooms all right,' he said, 'but no one attempts to sleep in them at this season.' Then, turning to our servant, he uttered the one word: 'Bugs'!

There was no alternative, so we spread a macintosh sheet on the *kang* and then lay down, leaving the candle

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We left Muleiho as soon as the weather permitted. Our Shansi friends were round early to see how we had fared, and to bring us a parting present of a slab of brick-tea, one foot wide by one and a half feet long, and two inches thick—a most decorative object, being stamped with handsome patterns. Brick-tea is much used in the North-West. A small chunk is broken off and boiled in a kettle of water, making an infusion which is of a pale colour and nearly tasteless. The bricks are made from the used leaves of the tea-shops, sun-dried and pressed into a cake.

The next two days took us past Chitai—'Great Height'—where we stayed in the suburb, the town itself being nothing but a mass of ruins inside a good castellated wall. We took our next stage by day, crossing the area which had received the full force of the cloud-burst on Sunday night. On every hand we saw the traces of the havoc wrought. Bridges were swept away, trees uprooted and crops ruined, and we were told that a large number of cattle had been drowned, as the rushing mountain torrent burst its bounds and had overtaken the herds before their owners could get them to a place of safety. From Chitai we came to Kucheng—'Ancient City'—which unlike Hami is not surrounded on all sides with fertile land, but is approached over a wide, sandy and treeless plain. From out of the howling wilderness we stepped direct into a large town, which appeared to us a veritable metropolis. Many large shops showed a splendid assortment of such glittering wares as the Chinese love—china cups and teapots, perfumes and scented soap, silks and cottons, clocks and hair-clasps. The tailors sat at their shop doors working Singers' sewing-machines, the Moslem bakers piled the hot rolls on counters as they drew them out of the brick oven, and the vege-

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When we were about one mile from the gate of Kucheng, a yell was heard, and our men hastily drew up, saying, '*Kwai che lai liao*'—the Express is coming! and in a swirl of dust, and with a wild jingle of many harness bells, three long-limbed, bony horses galloped madly past under the lash of the driver, who, having just caught sight of the town entrance, was bringing his team through the city gate and up the main street at a pace calculated to impress the populace! It was then that we saw the body of the cart was simply made of long poles lashed together, on which two passengers, clinging to the framework, were being hurled from side to side by the violence of the jolting. One glance at the 'Express' quickly satisfied us that such a mode of travel, while excellent for postal parcels, would be hideous torture to ordinary human beings if nerves formed any part of their anatomy, while some might scarcely survive the fifty-four hours of this frenzied mode of dispatch.

From Kucheng onwards it was no longer necessary to make night stages. Hot as it was, the animals stood it well, as each midday brought us to a wayside foodshop, where we were able to get something for ourselves and water for the mules, and the nights were now spent in towns of some importance. The direction of the road was south-west, as we had reached our most northerly point at Kucheng, and we were now following the line of the Tian Shan towards the dip which marks the position of Urumchi. The highest peak of this part of the Tian Shan was now coming into sight, the great Bogdo-ola—'The Mount of God'—which rises twenty thousand feet, and is seen from a great distance. This summit, with its surrounding peaks, is of a grand and rugged shape, and lends distinction to the country which would be insignificant were it not for this arresting

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feature. The first night after Kucheng we slept at Tsimusa—' The City of Everlasting Trust '—and seeing a military guard at the gate we knew that an officer would shortly call for our passports. On this occasion, however, the innkeeper failed to inform the authorities of the arrival of foreigners, and when the soldiers came to demand our papers they were exceedingly angry, and threatened him with a beating if he neglected this part of his duty again. The upshot of the fuss was that the innkeeper spent the whole night in raging and cursing officials, foreigners, passports, and soldiers alike, vowing that no ' foreign devil ' should again darken his doors ! To judge by the experience of this and other journeys in Kansu and Turkestan, it is of the greatest importance that travellers' passports should be in strict order, and up-to-date. We were required to produce these documents at the most unlikely places, and sometimes they were examined both on entering and on leaving a city, as well as at the Yamen. We were thankful to quit the ' Inn of the Cursing Landlord ' at 5 a.m. and proceed on our journey towards Santai—' The Third Stage.' The road took us for seventy *li* over grassy steppes, and for the last fifteen *li* we drove by rapid streams between fields of maize and sorgum, bordered by hedges and shaded by overhanging trees. The whole scene, apart from the nature of the crops, might have been an English rural landscape, and it warmed our hearts as we thought of the pleasures of soon wandering in English lanes and fields.

We were feeling the fatigue of our long journey much more severely now that we were enduring the added strain of great heat, and though the night stages were at an end, such a diary entry as : ' Rose at 2-30 a.m. and took a very heavy, hot stage,' speaks for itself. The carters also were suffering from the prolonged

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sleeping accommodation to be had, we contented ourselves with our cart. Some time before dawn the yard was astir. Every carter threw a measure of grain into his animal's trough, watered the beasts, then called to the landlord to settle the account, which transaction was always accompanied by squabbling and cursing, but not until the required amount was handed over did the big double doors open, and allow the carts to pass out. We, too, were up early, and for breakfast had the unaccustomed luxury of a bowl of warm milk which an old Chantow ladled out from a brass pot, in which it was kept hot over a brazier.

We were now entering the district known as 'Fly Land,' a name which speaks for itself, and from this time until we reached the higher and more arid land near Chuguchak, our meals were made revolting by these loathsome pests, which also made rest or sleep by day impossible. Knowing this, we had brought lengths of mosquito netting with which all our food was covered and in which we wrapped our provisions, but still the table was a black, moving mass of winged horrors. Soon after midday we were at Hutupi—a thirty-mile stage—which we accomplished with great ease. The range of the Tian Shan, culminating in the glistening Bogdo, made a most striking background, and the land around the villages was very fertile, producing good crops of millet, wheat and sorgum. At the Moslem inn where we stayed, all the best rooms were occupied by the family of the innkeeper himself, but we always had access to the harem, and through the womens' court a little back door took us straight out into fields near running water, where we enjoyed space and some coolness. The lane at the back of the house was also the connecting link with the back-door of every house on the north side of the village, and

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vegetables and fruit, especially grapes and apples, find a ready market in the capital. The grapes were the largest we had ever seen, and we carried in the cart an abundant supply which more than made up for the lightening of our load by the bread we had consumed! We were now only a few miles from the Manas River, which is the most important stream in this part of Turkestan. Its source is in the Celestial Mountains, but it finally loses itself in the sand. A little earlier in the season, when the snows were melting, the Manas River is often impassable, and a Chinese lady friend had a few weeks earlier been upset into the water and nearly lost her life. We were now in the last days of August, and it was already cold in the heights of the Tian Shan, therefore we had no cause to fear the sudden treacherous rise of the water which comes from the melting snow, and we crossed without difficulty.

Our next stopping-place was Ulan-Usun—'Blue Water'—where we had the advantage of occupying the inn room which had been papered and swept for the use of the Governor's son, who had preceded us on his way to Zaisan. Fresh red paper with eulogistic phrases decorated the door frame; clean matting covered the *kang*, and the court had been generally tidied up in honour of such an important guest. The flies, however, still remained.

The country here was splendid grazing ground, covered with tall 'chi-chi' grass. The Mongolian nomads pitch their tents on this plain during the winter months, when the cold drives them down from the higher pastures.

Our driver, though a surly cross-grained fellow, was beginning to thaw under our constant friendly advances. His knowledge of Chinese was very poor, but the present of a bunch of grapes or a piece of new bread,

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during which we travelled. Earlier in the summer the Manas and other rivers constitute a real peril. The cold in Turkestan and Southern Siberia in early winter increases the hardship of the way, and when the spring thaw sets in, the roads around Urumchi are sometimes impassable for weeks, owing to mud-pits which are so extensive that no cart can negotiate them.

CHAPTER XLIII

ARRIVAL AT CHUGUCHAK

On September 2nd we sighted Hsihu. It is an important town surrounded by a considerable area of irrigated land, where was the junction of the Ili and Chuguchak main roads. The place presented the usual aspect of a central point used by farmers as a market. The streets were very countrified; nevertheless large sums of money pass from hand to hand between the grain merchants and their customers. There were the usual bazaars, fruit and vegetable vendors, and general shops where travellers might buy a pail, basin, towel, soap, or cigarettes, while herbalists showed a dusty store of rhubarb, cardamoms, liquorice, fennel, cloves, and ginger. The inns were crowded with caravans travelling to Ili, or arriving from Siberia. Knowing that even by tarantass we should not reach Chuguchak for another ten days, and that on leaving this fertile land we should pass through a barren country providing neither fruit nor vegetables, we loaded up once more with cucumbers, melons, and grapes, and late in the evening a vine-grower appeared carrying a basket of splendid fruit freshly cut, on which we all feasted for several days. A long stage of sixty miles, the latter part of which was over a sandy waste between tamarisk

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mounds and clumps of saxaul, brought us to the borders of the Kueitun River, by the banks of which was a village where we spent the night. The river, which was wide and rapid, was crossed by a good bridge. From our inn court we had access to the bank, so we took advantage of the running water to wash a few clothes, not that we expected to make them the cleaner by dipping them in the yellow flood, but as fleas were very bad we hoped that some of them would be carried away by the force of the current.

At 2-30 a.m. Sandy Macnab fetched us out of bed for an early start. A twenty-five mile drive, over loose sand mixed with loess, brought us to one single hut where a handsome Chantow woman and her daughter, wearing red veils, talked to us while we boiled a saucepan of hot water and cooked a meal. There was only one well, with a very poor supply of water.

The thirty miles of the afternoon stage to Hansantai traversed a road so hard and even that it would have been reckoned as a good motor-track in any country. Here we rested for the Sunday. We were now near a region where many travellers had been robbed, for the country was wild in the extreme and offered a natural protection to brigand bands. The Governor had placed a military guard at this point, to supply escorts as needed, and a band of mounted police patrolled the roads. In this lonely spot lived two old men, brothers, who told us that at the age of fourteen and sixteen they had run away together from their home in Sian, and wandering to 'Kow Wai' had lived here ever since, never returning to their relations, nor even ever hearing of them again. They were now both over sixty years of age, and their one pleasure in life was to sit and talk with travellers from China, from whom they were never weary of hearing of the glories of modern Sian.

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noon when we left Ertaochiao on the understanding that it was but a very short distance to an inn, which, though situated in a desert district, and very small, was reported to be comfortable. Mr. Hunter then kindly went ahead to make preparations at the inn, and we followed him over a country which became increasingly desolate. The track led across a sandy waste, between tamarisk mounds and an occasional tuft of 'chi chi' grass. There was no telegraph wire to guide us, and hour after hour we drove on through the same monotonous scenery, with no distinctive marks and no sign of the inn we were seeking. Both drivers confessed themselves baffled, and as the darkness fell they had to admit that we had missed our way, and although they dismounted and walked about seeking a landmark, they found none. Moreover, travellers in these regions are loath to shout or to light camp-fires, for fear of revealing their whereabouts to horse-stealers. After a considerable time a voice was heard calling, which we recognised as that of Nimga, but on replying we were answered from another direction by Mr. Hunter, when gradually we all came together again and found that he, too, had missed the inn, so that we had no option but to push on. At midnight we were still going, but were suddenly brought to a standstill by entering a soft marshy ground, the extent and treachery of which it was impossible to gauge. Three of the carts of merchandise were already in the bog, from which they could not be extricated, so the horses' legs were secured with iron padlocks, while the whole party lay down on the ground, and in five minutes all were sound asleep. Four hours' drive on the next morning brought us at length to Chuguchak, where we were indeed glad to get our first substantial meal in twenty-four hours.

This town is known to Russians as Chuguchak, to

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WAKHAN: OR HOW TO VARY A ROUTE

By MAJOR H. W. TILMAN, D.S.O., M.C.

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IT is a good many years since an Englishman crossed the Wakhjir Pass to follow the ancient route down the Oxus, so perhaps a brief note may be of interest. (Not that the lapse of time has effected many changes in Wakhan.) But before reaching Wakhan I should explain how I got there and in what circumstances.

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No traveller willingly follows a well-known route if there is a less known, so when returning last year from Kashgar to Gilgit I tried some slight variations. Between Kashgar and Tashkhurgan there is a choice of several routes, but all of them are moderately well known so that anyone with rooted objections to following the beaten track is not easily accommodated. One can reach the Little Kara Kul by three different ways and thence proceed west of the Muztagh Ata massif: or to the east of this there is the ordinary route by Yangi Hissar and the Chichiklik Pass, or a variation by way of the Karatash Valley which rejoins the ordinary route at Toile Bulung. But neither of these last two go near Muztagh Ata and since I much wanted to see the unexplored eastern side of the mountain I planned a roundabout deviation from the last-named route over the Karatash Pass and thence up the Tur Bulung nullah. At the head of this there is a pass marked on the map (Sheet 42 N, ½ in.) with a query against it, which, if it could be crossed, would lead one down to rejoin the ordinary route at Chichiklik maidan.

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Accompanied by a Turki from Kashgar we crossed the Karatash Pass (16,338 feet) on ponies on September 17th in a fierce wind. The weather was, and continued to be, unsettled, so that I was disappointed of my principal hope of seeing Muztagh Ata close from the east. There were some yorts in the valley on the other side of the pass and to the south a glacier, covered with unblemished white névé, descended gradually from an easy-looking col. Had we been without baggage ponies it would have been tempting to embark on it to force a direct route to the south; instead, we went on down the valley past the Tur Bulung junction and as far as Kang Showar before we found any more yorts.

The Tur Bulung Pass was said to be unsuited to ponies so we sent them round by Little Kara Kul and Subashi, and ourselves, with a Kirghiz guide and a yak, went back up the Tur Bulung. Snow and heavy cloud prevented us from seeing anything but occasional glimpses of the 19,000-ft. eastern outlier of Muztagh Ata. Four miles up the Tur Bulung valley there is the snout of a big glacier of true debris-covered Himalayan type, quite unlike the clean white slabs of ice which spill over the gentle western slopes of Muztagh Ata like icing sugar on a bun. This glacier bore away south-west and then west into a wide bay, while the Tur Bulung stream, which we followed, comes down from the south-east from a wide upland valley—a hanging valley—a thousand feet or so above the glacier. Our guide called the glacier Kok Sel, which is also the name

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of a glacier of the Kungur group according to Sir Aurel Stein's map. This upper valley was well tenanted by Kirghiz at whose yorts we stopped that night just below the snow line.

The snow which fell that night obliterated all signs of the track, but in 2½ hours our guide took us unerringly to the top of the pass which he called Yambulak—not Tur Bulung. A glacier on the east side of Muztagh Ata is also called Yambulak. I guessed the height to be about 16,000 feet, and though the track is boulder-strewn, lightly laden ponies could cross the pass if clear of snow. From here we dropped about a thousand feet before climbing again to the Yangi Dawan which overlooks the Chichiklik maidan from the north. This great grassy plain lying at a height of 15,000 feet, in summer thick with grazing yaks, was now bare of life. It was a windy cold evening, so that we were lucky to find shelter in the squalid yort of a family who were trying to live like Kirghiz without the essential livestock. Their sole livestock were five sheep and they existed precariously on the bounty of stray travellers like ourselves. From here we reached Tashkurghan next day by the usual route down the horrible, bone-strewn Dershat defile.

Between Tashkurghan and Gilgit the seeker after variety is hard put to it. As a variation to the Mintaka Pass route, that over the Kilik Pass, by reason of nearness and similarity, hardly qualifies, while the only other alternative seemed to be a very generous sweep to the east by the Oprang Valley and back into the Hunza Valley by the Shingshal route. But if in order to avoid the usual I must indulge in wide generous sweeps, there was a more interesting one to be made to the west over the Wakhjir Pass and back into India by either the Irshad or Khora Bhort Pass and so down the Karumbar Valley to Gilgit. It was unfortunately true that this route entailed crossing a frontier as well as a pass—and frontiers are usually the more difficult—but I should not have to be on the wrong side of it more than two days before nipping smartly back to the right side.

From Mintaka Karaul, where there is the last Chinese post, we followed the main valley westwards, leaving the Mintaka and Kilik Passes on our left. It is a fine open valley, comparatively rich in grass but bare of life—deserted, one supposes, on account of its proximity to the Russian frontier. We crossed the Wakhjir (16,150 feet) on September 28th accompanied by some Kirghiz whom we had met a few miles below the pass. They had come there only the day before and were one of some thirty families who, we were told, were migrating to Chinese territory from the Murghab Valley east of the Chakmaktin lake on account of incursions and harryings by Kirghiz from the Russian side. We camped at a yort on the bank of the river less than two miles below the ice cave at the snout of the unnamed glacier which is, I think, accepted now as the true source of the Oxus.

Between here and Bozai Gumbaz there were only a group of yorts on the south side of the river and a small homestead on the north bank where an attempt was being made to grow barley. "Gumbaz"—the conical mud cupola on a square base built in memory of some holy man—were far more numerous than people. There is peat on the flats on either bank of the river and many stacks of it drying were perhaps evidence of a